

----- Original-Nachricht -----

Betreff: PLEASE READ ENGINEERING NOTES FOR DETAILS OF  
PARAMETERS WHICH  
EXCEED SPECIFICATION LIMIT - DELPHINUS. 04/12/2013 - SUBMITTED  
TEST RESULTS

Datum: Mon, 9 Dec 2013 17:42:09 +0000

Von: SHIPCARE (Lintec) Results  
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An: GRS-TECH (office@rohden.de) <office@rohden.de>

Lintec Testing Services Limited

Sample information collated from Vessel 's Bunker Data form  
and sample bottle label.

Fuel Quality Report - SUBMITTED

Sample No. HN4726

Vessel DELPHINUS.  
Client GRS Rohden Shipping GmbH  
Act Bunker Date 04/12/2013  
Bunker Port EVERGLADES  
Quantity Del. 100 M.T.  
Grade Ordered RMG380  
Bunker Supplier TRANSMONTAIGNE  
Barge BERTH-33  
Sample Location SHIP'S BUNKER LINE  
Supplier's Specs: Density - @15=983.4  
Viscosity - @50=329.6  
Sulphur - 0.96%

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Received at Lab 06/12/2013 at 19:23 Hrs  
Courier Ref 551127064737  
DHL PAD Used No  
Lintec Sample Seal 0886592/511741

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TEST METHOD UNITS RESULT SPEC  
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DENSITY ISO 12185 kg/m³@15° 985.0 991 MAX  
VISCOSITY ISO 3104 CST@50°C 348.4 380 MAX  
VISCOSITY ISO 3104 CST@100°C 32.7 35 MAX  
FLASH POINT ISO 2719 °C >70 60 MIN  
POUR POINT ISO 3016 °C <-12 30 MAX  
MCRT ISO 10370 %MASS 12.3 18 MAX  
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ASH	ISO 6245	%MASS	0.06	0.15	MAX
WATER	ISO 3733	%VOL	0.25	0.5	MAX
SULPHUR	ISO 8754	%MASS	0.96	1.00	MAX
COMPATIBILITY	ASTM 4740	SPOT#	1	2	MAX
VANADIUM	ISO 10478MOD	mg / kg	67	300	MAX
SODIUM	ISO 10478MOD	mg / kg	23		-
ALUMINIUM	ISO 10478	mg / kg	42		-
SILICON	ISO 10478	mg / kg	43		-
AL + SI CALCULATIO	ISO 10478	mg / kg	*85*	80	MAX
TOTAL SED, POTENTI	ISO 10307-2	% (m/m)	0.04	0.10	MAX
NET CAL VAL	ISO 8217:A	MJ/KG	40.77		-
CCAI	ISO 8217:B	INDEX#	847		-
OPERATIONAL ADVICE			-		
INJECTION TEMPERAT	@ 10 CST	°C	143		-
INJECTION TEMPERAT	@ 15 CST	°C	127		-
MINIMUM PUMPING TE	@ 1000 CST	°C	33		-
ADDITIONAL METALS			-		
IRON	ISO 10478MOD	mg / kg	26		-
NICKEL	ISO 10478MOD	mg / kg	36		-
CALCIUM	ISO 10478MOD	mg / kg	29		-
MAGNESIUM	ISO 10478MOD	mg / kg	1		-
LEAD	ISO 10478MOD	mg / kg	<1		-
ZINC	ISO 10478MOD	mg / kg	<1		-
TOTAL ACID NUMBER	ASTM 664	mg/g	0.65	3.0	MAX
OPERATIONAL ADVICE			-		-
CHEMICAL CONTAMINA	LINMS	-		-Not Tested	
PHOSPHOROUS	ISO 10478MOD	mg / kg	<1		-

ONBOARD FUEL BLENDING IS NOT RECOMMENDED

\*Refer to your engine manufacturer's for max/min alarm settings

Spec. density:	991.0	@15C	Spec. viscosity:	380.0
@50C				
Supplier density:	983.4	@15C	Supplier viscosity:	329.6
@50C				
Sample density:	985.0	@15C	Sample viscosity:	348.4
@50C				

Spec. sulphur: 1.00%  
 Supplier sulphur: 0.96%  
 Sample sulphur: 0.96%

Lab Technician : Premalatha Indupalli

Sample results are compared with the spec, RMG380

The above analysis was carried out on a sample supplied by your vessel's Chief Engineer in accordance with the Bunker Data Form returned to us. The sample bottle was sealed on arrival. The seal was broken to allow the analysis to be carried out.

#### ENGINEERING NOTES:

Based upon the analytical results measured in this sample these indicate that your listed specification parameters requirements are NOT met on this occasion.

The following engineering notes are given in good faith for guidance only, always check with your Company Instructions and machinery manufacturer's instructions before taking any actions.

\* COMBINED ALUMINIUM & SILICON CONTENT EXCEEDS SPECIFICATION (RESULT 85 mg/kg AGAINST 80 mg/kg LIMIT) \*

Please note that this result is within the established 95 % confidence limits of the specification and as such it must be stressed that if the sample was to be re-analysed by another laboratory the result obtained may well indicate that the sample is marginally on specification.

The sample result indicates the presence of abrasive contaminants. If not removed, possible wear damage may occur to fuel pump plungers and barrel, injector needles and cause increased cylinder liner and piston ring wear.

On the above basis, we would recommend that this fuel is NOT USED pending confirmation that the sample submitted to our laboratory was representative of the product supplied. If possible, samples should be taken from the bunker tanks and submitted for analysis. We would also recommend that the possibility of obtaining samples before and after the purifiers, without adversely affecting the operation of the main engine, be investigated. As with the taking of all samples, it is essential that the chief engineer makes every effort to ensure that the most representative sample possible is taken. If the sample is to be taken from the transfer pump then the tanks should be circulated for at least 30 mins prior to this. Furthermore, the sampling point should be cleared of all other product by running through several litres of this fuel prior to the taking of the sample.

Analysis of these samples will give an indication of the efficiency of the purifiers and the Al + Si content of the fuel that has been through the pre-treatment process. If these results are confirmed outside critical operating levels, it must be stressed that the vessel probably will suffer damage to the engine through the use of this fuel.

Typically the engine manufacturers set operating levels of 10 - 15 mg/kg at the point of injection. Centrifuges run efficiently between 70 - 90 % separation. Please check with your engine manufacturer for details.

However, if the vessel has no other alternative than to use the fuel, it is important that the fuel is efficiently centrifuged.

- \* The Centrifuges should be run in series as clarifier/clarifier.
- \* The purifier should be checked to ensure that the optimum gravity disc is installed and the lowest possible flow-rate should be used (just enough to meet daily consumption).
- \* Keep the inlet temperature to the purifiers as close to 98 °C as possible.
- \* If possible, change the filter between service tank and engine to the lowest available.

We would suggest that the suppliers are put on notice and the retained sample on board the vessel is secured pending further investigation.

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\* HAVE YOU GOT ENOUGH SAMPLE BOTTLES?  
\* IF NOT, SEE YOUR INSTRUCTION FOLDER FOR SUPPLY DETAILS.  
\* ALTERNATIVELY CONTACT THE LINTEC LOGISTICS DEPARTMENT  
ATtesting@lintec-group.com OR CALL 0044 1325 390180.  
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Sample Reports prepared by Michael Atkinson / Lintec  
Testing Services Limited.  
SHOULD YOU WISH TO DISCUSS THIS TEST REPORT OR ANY OTHER  
TECHNICAL ISSUE PLEASE CONTACT OUR RESULTS DEPARTMENT AT  
results@lintec-group.com OR CALL 0044 1325 390183.

Signed: Premalatha Indupalli Report Date:  
06/12/2013  
on behalf of Lintec Testing Services Ltd.

Valued Quality. Delivered.

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